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Measurements of the Helium-4 Lambda-Point in a Ground Based Low Gravity Simulator MELORA LARSON, FENG CHUAN LIU, ULF ISRAELSSON, *Jet Propulsion Laboratory, California Institute of Technology* The λ-transition in ^{4}He provides an almost ideal system for testing theory against experiment. The only intrinsic limitation in this system is that there are gravitationally induced pressure variations in any macroscopic helium sample that limit how closely the transition can be approached in traditional ground based experiments. To overcome this limitation, we have taken advantage of the finite magnetic susceptibility of ^{4}He to build a low gravity simulator consisting of a superconducting magnet with a magnetic field profile shaped to counteract the force of gravity in a helium sample. When a magnetic field with $B \times \partial B/\partial z = 21 T^2/cm$ is applied at the location of the cell, the gravitationally induced pressure variations will be cancelled to within 1% over a limited volume. The total effective gravitational field inside the low gravity simulator acting on the helium sample was measured by measuring the axial dependence of the λ-transition temperature. The verification of the low gravity simulator as well as preliminary transport measurements made using this low gravity simulator will be presented. Finally, the limitations of the magnetostrictive technique in comparison to doing space based experiments will be presented.

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